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| 10/604,142 | 06/27/2003 | Duane E. Allen | BUR920030027US1 | 1141 |

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| EXAMINER | |
|---|---|
| STEVENSON, ANDRE C | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/604,142 | ALLEN ET AL. | |
| | Examiner | Art Unit | |
| | ANDRE' C. STEVENSON | 2812 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *23-55* is/are allowed.

6)☒ Claim(s) *1-11,17 and 19-22* is/are rejected.

7)☒ Claim(s) *12-16 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/27/03, 07/21/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## Detailed Action

***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 06/27/03 and 07/21/03 were filed before the first action on the merits of the case. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims #1-7, 9-11, 17, 19 and 21** are rejected under 35 U.S.C. 102(e) as being anticipated by Okumura et al. (U.S. Pub. No.2002/0113218, Pub. Date 08/22/02, Filed Date 04/14/99).

Okumura shows, in a similar method and apparatus for positioning a substrate and the like, **pertaining to claim #1**, a system for of aligning a mask to a substrate comprising **(page#2, paragraph 0016; page #5, paragraph 0054)**: an alignment fixture for temporarily holding said mask and said substrate in fixed positions relative to each other **(Abstract; page #3, paragraph 0027; page #4, paragraph 0035)**; means for holding said substrate by a bottom surface, said means for holding said substrate protruding through an opening in a table and an opening in said alignment fixture, said means for holding fixedly mounted on a stage assembly, said stage assembly moveable in first and second directions and rotatable about an axis relative to said table; means for temporarily affixing said alignment fixture containing said mask and said substrate to said table **(page #3, paragraph 0026-0027; page #4, paragraph 0035)**; means for controlling said means for temporarily affixing so as to generate a uniform force around a perimeter of said alignment fixture to effectuate said temporarily affixing **(page #4, paragraph 0039-0041)**; for aligning said mask to said substrate, said means for aligning controlling movement of said stage assembly in said first and second directions and rotation about said axis; and means for temporarily fastening said alignment fixture together **(page #3, paragraph 0033; page #5, paragraph 0054; page #6, paragraph 0060).**

Pertaining to **claim #2,** Okumura shows a system, wherein said axis is perpendicular to said table **(page #3, paragraph 0031; page #5, paragraph 0054).**

Pertaining to **claim #3,** Okumura shows a system, wherein said axis is perpendicular to said table **(page #3, paragraph 0031; page #5, paragraph 0054)).**

Pertaining to **claim #4,** Okumura shows a system, wherein said means for holding said substrate is a vacuum chuck including a circular array of O-rings adjacent to a perimeter of said chuck, each O-ring extending above a top surface of said chuck and surrounding a vacuum port **(page #5, paragraph 0054 and 0058).**

Pertaining to **claim #5,** Okumura shows a system, wherein said means for holding said substrate is a vacuum chuck including a circular array of O-rings adjacent to a perimeter of said chuck, each O-ring extending above a top surface of said chuck and surrounding a vacuum port **(page #4, paragraph 0041).**

Pertaining to **claim #6,** Okumura shows a system, further including means for releasing vacuum pressure applied to said vacuum chuck when said uniform force reaches a predetermined value **(page #4, paragraph 0041).**

Pertaining to **claim #7,** Okumura shows a system, further including at least two mask alignment pin mechanisms, said mask alignment pin mechanisms mounted to said table and containing alignment pins, said alignment pins passing through alignment pin holes in said table and alignment pin holes in said alignment fixture and engaging mask alignment holes in said mask **(page#2, paragraph 0016 ; page #3, paragraph 0033; page #4, paragraph 0035, 0039-0041; page #5, paragraph 0054; page #6, paragraph 0060).**

Pertaining to **claim #9,** Okumura shows a system, wherein said mask alignment holes comprise a circular alignment hole and a slot **(fig. #5a-b, 8a-b and 11; page #7, paragraph 0072; page #4, paragraph 0036; page #10, paragraph 0101).**

Pertaining to **claim #10,** Okumura shows a system, wherein said mask alignment holes are diametrically opposed **(fig. #5a-b, 8a-b and 11; page #7, paragraph 0072; page #4, paragraph 0036; page #10, paragraph 0101).**

Pertaining to **claim #11,** Okumura shows a system, wherein said means for temporarily affixing are two ore more clamping mechanisms uniformly spaced around a perimeter of said alignment fixture **(fig. #5a-b, 8a-b and 11; page #7, paragraph 0072; page #4, paragraph 0036; page #10, paragraph 0101).**

Pertaining to **claim #17,** Okumura shows a system, wherein said means for aligning comprises a pattern recognition system including a camera and a computer, said pattern recognition system for determining locations of center points of alignment targets on said substrate and alignment marks on said mask relative to a fixed position of said stage assembly and for calculating a distance to move said stage assembly in said first direction, a distance to move said stage assembly in said second direction, and a angle to rotate said stage assembly through in order to align said center points of said alignment targets with said center points of said alignment marks **(page#2, paragraph 0016 ; page #3, paragraph 0033; page #4, paragraph 0035, 0039-0041; page #5, paragraph 0054; page #6, paragraph 0060).**

Pertaining to **claim #19,** Okumura shows a system, further including a computer for controlling and coordinating vacuum pressure to said means for holding said substrate, operation of said two or more means for temporarily affixing, operation of said means for controlling said means for temporarily affixing, operation of said means for aligning, and operation of said means for temporarily fastening **(page #6, paragraph 0064, 0066, 0068).**

Pertaining to **claim #21,** Okumura shows a system, wherein said substrate is a semiconductor wafer **(page#2, paragraph 0016 ; page #3, paragraph 0033; page #4, paragraph 0035, 0039-0041; page #5, paragraph 0054; page #6, paragraph 0060).**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claim #8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. Pub. No.2002/0113218, Pub. Date 08/22/02, Filed Date 04/14/99) as applied to claims **#1-7, 9-11, 17, 19 and 21** above, and in view of Barringer et al. (U.S. Pat. No.6,198,525 B1, Pat. Date 03/06/01, Filed Date 02/19/99).

Okumura substantially shows the claimed invention, as shown in the areas cited in the above rejection.

Okumura fails to show, with respect to **claim #8**, a system, wherein said alignment pins are spring loaded and can move in a third direction perpendicular to a table.

In a similar system for contact imaging of substrates, Barringer teaches pertaining to **claim #8,** a system, wherein alignment pins are spring loaded and can move in a third direction perpendicular to a table **(column #7, lines 44-55).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made, with respect to **claim #8**, to include a system, wherein said alignment pins are spring loaded and can move in a third direction perpendicular to a table, into the method of Okumura, as taught by Barringer, with the motivation that the addition of spring loaded pins that can move a third direction would allow for a more expedient and accurate alignment process.

**Claims #20 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. Pub. No.2002/0113218, Pub. Date 08/22/02, Filed Date 04/14/99) as applied to claims **#1-7, 9-11, 17, 19 and 21** above, and in view of Page et al. (U.S. Pat. No.3,669,060 B1, Pat. Date 06/13/72, Filed Date 09/24/70).

Okumura substantially shows the claimed invention, as shown in the areas cited in the above rejection.

Okumura fails to show, with respect to **claim #20**, a system, wherein the mask is a metal mask. Also, Okumura fails to show, with respect to **claim #22**, a system, wherein the mask, is a solder bump evaporation mass.

In a similar method for changing a mask used in the evaporation of thin film electronic components, Page teaches, with respect to **claim #20**, a system, wherein the mask is a metal mask **(fig. #1-2, items 34, 36, 38 and 40; column #2, lines 35-41; column #3, lines 55-67)**.

Page also teaches, pertaining to **claim #22,** a system, wherein said mask is a solder bump evaporation mass **(fig. #1-2, items 34, 36, 38 and 40; column #2, lines 35-41; column #3, lines 55-67).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made, with respect to **claim #20**, to include a system, wherein the mask is a metal mask, into the system of Okumura, as taught by Page, with the motivation that a metal mask would provide a conductible surface for the manufacturing of the item.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, with respect to **claim #22**, to include a system wherein said mask is a solder bump evaporation mass, into the system of Okumura, as taught by Page, with the motivation that the deposition of a mask by way of an evaporation process, allows for the smooth and even layering of a metal material.

***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance: While the prior art teaches an alignment system consisting of a clamping structure, both vacuum and mechanical, it fails to teach either collectively or alone, increasing an applied clamping force to a second predetermined amount of force, releasing the substrate for the chuck and increasing the applied clamping force to a third predetermined amount of force.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

**Claims #23 through 55 are allowed.**

**Claim #23, 33**

- Increasing the applied clamping force to a second predetermined amount of force, releasing said substrate from said chuck, and increasing the applied clamping force to a third predetermined amount of force.

## Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure; Baxter et al. (U.S. Pub. No.2002/0139484), Migliuolo et al. (U.S. Pub. No.2006/0235314), Schellenberg et al. (U.S. Pat. No.3,499,714), Schindler et al. (U.S. Pat. No.3,516,386).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre' Stevenson whose telephone number is (571) 272 1683. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272 1873. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956. Also, the proceeding numbers can be used to fax information through the Right Fax system;

(571) 272-1683

Andre' Stevenson

03/23/08
/Michael S. Lebentritt/

Supervisory Patent Examiner, Art Unit 2812